

## DSM 5 – Specific Learning Disorders – Implications for practice



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## Overview

- A little history
- Learning Disabilities – A Model
- Academic Skills Deficits -Visible Signs
- Core Cognitive Processes –
  - Phonological Processing / Working Memory / Orthographic Processing
- Teaching Strategies and the Three Wave Model
- Assessment of Learning Disorders – DSM 5
- A Case Study

## Debates over definitions

“No single problem has plagued the study of learning disabilities more than the problem of definition. At the heart of the problem is a lack of understanding of the criteria by which different disorders are classified.”

Source: Fletcher, J.M., Lyon, G.R., Fuchs, L.S., Barnes, M.A. Learning Disabilities – From Identification to Intervention, (2007), The Guilford Press, London, p 25

## Models used to identify students with learning disabilities

- Aptitude-achievement discrepancy
- Low achievement
- Intra-individual differences
- RTI (Response to Intervention)
- Exclusionary criteria

It is assumed that the aim of any system attempting to classify learning disabilities is designed to identify those individuals who represent a specific sub-group – i.e. students demonstrating unexpected underachievement.

## Aptitude-achievement discrepancy

- Traditionally this has been the most common approach used to classify students as being learning disabled.
- Aptitude – as measured through cognitive ability testing (IQ) is compared to achievement – as measured through standardised tests of academic achievement (eg. word reading; reading comprehension; spelling; written expression).

## Aptitude-achievement discrepancy

- Operates as ‘wait to fail’ model;
- Offers little insight into the specific needs of the child;
- Does not inform instruction.

### Low achievement

- This model identifies all children failing to achieve at a reasonable level as being potentially learning disabled.
- Essentially rules out all students performing within the average range – problematic for students with strong cognitive profiles.

### Low achievement

Also –

- Operates as 'wait to fail' model;
- Offers little insight into the specific needs of the child;
- Does not inform instruction.

### Intra-individual differences

- Research demonstrates that learning disabilities are frequently associated with specific impairments in cognitive processes and that there is variability in the cognitive strengths and weaknesses displayed by individuals with SLDs.
- A individual with an SLD will often have strengths in a number of areas but weaknesses in one or more core cognitive processes that lead to underachievement.
- Impossible to identify a consistent profile

### RTI (Response to Intervention)

- Unlike the previous models, RTI adopts a process of early identification of students at academic risk, followed by **multiple** assessments.
- By tying assessments to specific attempts to intervene, unexpected underachievement can be identified on the basis of inadequate response to instruction.

### RTI (Response to Intervention)

- Repeated curriculum-based assessments
- Student is provided with instruction of sufficient quality and intensity that improved outcomes would be expected
- Unexpected underachievement = poorer response to instruction than would be expected from most other students

### RTI (Response to Intervention)

- Discrepancy is assessed relative to learning expectations based on multiple administrations of the same test over time
- Response to instruction cannot be the sole criterion for identification
- Flexibility in decision making will be required

## Response to Intervention (RTI)

- Provides early intervention.
- May reduce the number of referrals.
- Attempts to provide all students with adequate interventions.
- Helps monitor the progress of all students.
- The regular curriculum-based assessment should inform ongoing instruction / intervention.

## Response to Intervention (RTI)

However:

- Unknown reliability
- High variability in the effectiveness of instruction and intervention

Fletcher, Denton & Francis. (2005) *Validity of Alternative Approaches for the Identification of Learning Disabilities: Operationalizing Unexpected Underachievement*, *Journal of Learning Disabilities* (38)

## RTI does not...

- Classify
- Individualize
- Diagnose\*\*

(\*\* Contributes to diagnosis in DSM 5)

## Exclusionary criteria

“Learning Disabilities are not considered to be the direct result of intellectual disability, physical and sensory deficits or emotional difficulties. Neither do they appear to derive directly from inadequate environmental experiences, or lack of appropriate educational experiences.” \*

\*Note: new exclusionary criteria in DSM 5

## Evaluation of models

- There has been a great deal of research examining the effectiveness of different models of SLD diagnosis.
- No specific model has responded well to this analysis.
- Issue relates to dependence on a single criterion – unlikely to yield reliable information from a low base-rate condition (such as reading disability)

Waesche, J. B. et. al. (2011). ...'Examining\* *Journal of Learning Disabilities*, 44, 296 - 307

- Two-year (year 1 – 3) longitudinal study involving 288,114 students using 4 definitions (discrepancy / low achievement / RTI / intra-individual) found poor to moderate rates of agreement.
- One-year longitudinal stability poor.
- Issue identified as being the use of cut-off points. For low-base-rate conditions high numbers are close to the cut-off point.

\*Examining agreement and longitudinal stability among traditional and RTI-based definitions of reading disability using the affected-status agreement statistic.\*

## Hybrid Model

- The Hybrid Model ensures that more sources of information are used;
- Is able to incorporate multiple indicators of LD to create a comprehensive identification framework;
- A consensus group of researchers\* convened by the US Dept. of Educ. Proposed a hybrid model composing three criteria:

\*Bradley, R., Daneilson, L., & Hallahan, D., (2002)  
*Identification of Learning Disabilities: Research and Practice.*  
 Mahwah, NJ: Lawrence Erlbaum

## Hybrid Model (Bradley et. al. 2002)

- First – the student must demonstrate low achievement;
- Second – evidence of insufficient response to effective, research-based intervention/s;
- Third – the poor achievement is not attributable to exclusionary factors such as intellectual disability, sensory deficits, lack of proficiency in the language of instruction, and lack of opportunity to learn.

## Hybrid Model (Bradley et. al. 2002)

This particular model:

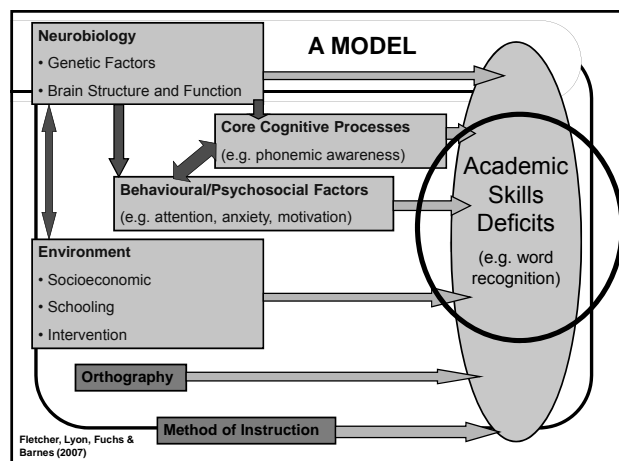
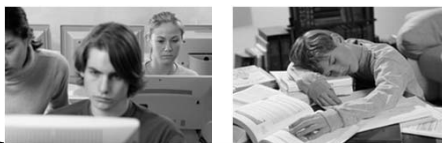
- has never been evaluated empirically.
- does not include much of what we know about learning disabilities.
- Is strikingly similar to DSM 5?!

## An expanded hybrid model

Combines features of all models at different stages of the identification process:

1. Failure to respond to quality instruction;
2. Curriculum-based assessment;
3. Evidence-based intervention
4. FTI (Failure to Respond to Intervention)  
 → further assessment, investigation beyond the achievement domain (eg. cognitive, language, behavioural, etc.)
5. **Full psycho-educational assessment – diagnosis of learning disability**

## Learning Disabilities – A Model



There are a number of specific skill disorders.

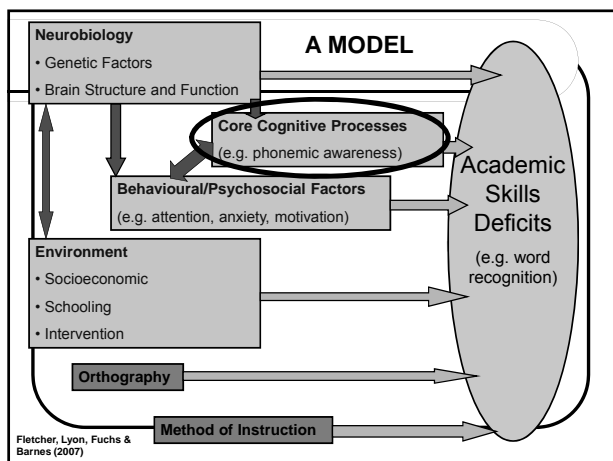
Generally referred to as  
Specific Learning Disabilities or  
Specific Learning Disorders

- **Reading Disability (Dyslexia)**
- **Written language (Dysgraphia)**
- **Mathematics (Dyscalculia)**
- “Dys” = intrinsic or developmental



## Visible Signs – Reading Disorder

- Identify the specific ‘visible signs / academic skill deficits’ that you would generally assess as part of a comprehensive assessment.
- Compare and discuss in groups of three or four.



## Core Cognitive Processes ....



## Cognitive Processes & Academic Learning

Reading Decoding	Reading Comprehension	Written Language	Mathematics
Phonological Processing	Working Memory	Working Memory	Working Memory
Short-Term Memory	Long-Term Memory	Executive Processing	Fluid Reasoning
Visual Processing	Executive Processing	Processing Speed	Visual Processing
Sequential Processing	Fluid Reasoning	Planning	Processing Speed
Working Memory			Planning
Long-Term Memory			

## Cognitive Processing

Students with learning disorders are frequently identified with underlying processing weaknesses:

- Phonological processing
  - Phonological awareness
  - Phonological memory
  - Rapid Automatised Naming (RAN)
- Working memory
- Orthographic processing
- Processing Speed

## Associated Features Supporting Diagnosis

- Many of the features supporting diagnosis of SLD detailed in DSM 5 are associated with processing weaknesses, for example:
  - Difficulty with rhyming and articulation;
  - Difficulty learning letter names / sounds;
  - Poor phonemic awareness;
  - Difficulty learning P-G correspondences
  - Sequencing difficulties;
  - Difficulty learning orthographic patterns, etc.

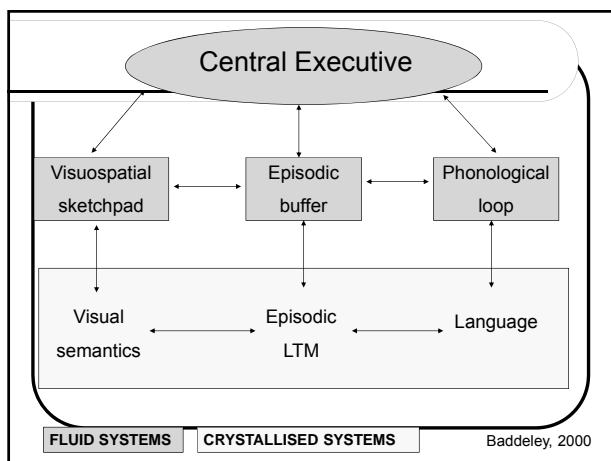
## Phonological processing ...(processing of speech)



## Aspects of Phonological Processing

- Phonological awareness ... including phonemic awareness (PA)
- Speech production of single phonemes and phoneme sequences
- Phonological memory .... Including the storage and retrieval of words, digits, and letter names (PM)
- Rapid Automatised Naming (RAN)

## Working memory ...

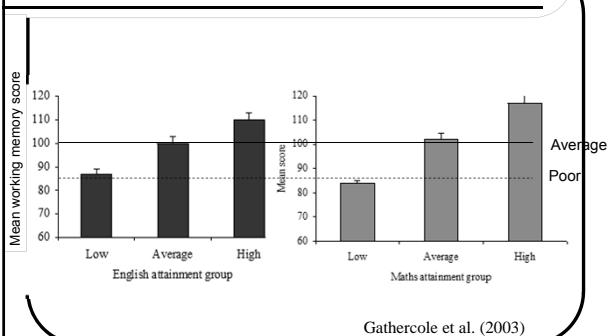


## The Role of Working Memory in Literacy and Numeracy Development

- Numerous studies report strong relationships between working memory and achievement in academic skills.
- Reading decoding is primarily related to phonological short-term memory and verbal working memory.
- Reading comprehension is primarily related to verbal working memory, executive functioning and long-term memory.
- The development of maths skills is strongly related to verbal and visual working memory, executive functioning and long-term memory.

(Swanson and German, 2007), .....

Mean working memory scores as a function of English and Maths attainment groups, data from 11-year olds



## Principles of classroom support

- Be aware of the warning signs of working memory failure
- Monitor the child
- Reduce amount of information to be stored
- Reduce difficulty of processing
- Be prepared to re-present important information
- Encourage the use of memory aids
- Help the child to use strategies

## Orthographic processing ...



## What do we mean by Orthography and therefore Orthographic Processing?

From the Greek Roots:

- Orthos: *Correct*
- Graphus: *To write*



*Literally means 'correct writing'*

## Orthographic Knowledge

- Orthographic knowledge is thought to play an important part in literacy acquisition.\* It is considered to be the stored information that allows us to represent spoken language in the written form.
- As we develop a working knowledge of written language we store initially tens and gradually hundreds of MGRs (Mental Graphemic Representations) that allow us to spell accurately

\* Apel, Wolf & Masterson, 2006; Berninger et. Al., 2006; Castles & Coltheart, 2004; Roman, Kirby, Parilla, Wade-Woolley & Deacon, 2009.

## Phonics knowledge is necessary (but not sufficient) for orthographic knowledge

- The **initial code**: common letter / sound relationships using one or more letters (e.g. 'b' 'o' 'sh' 'ay') ... a representation for all 44 sounds of English.
- The **extended code**: alternate spelling patterns for each sound (eg. 'bb' 'ai' 'a\_e') and – alternate pronunciations for the same graphemes (eg. 'ea' can be /ee/, /ā/ and /ai/ as in read, bread, and steak)

## Orthographic Knowledge

Students with orthographic processing difficulties frequently make errors of the following type..

- Illegal English spelling strings – e.g. cp / fw / mlg / etc.
- Positional errors – e.g. 'ck' to start a word / 'oi' at the end of a word.
- Failure to integrate spelling guidelines .. Double consonant rule / split vowel rule etc.

**Even when concepts have been taught well.**

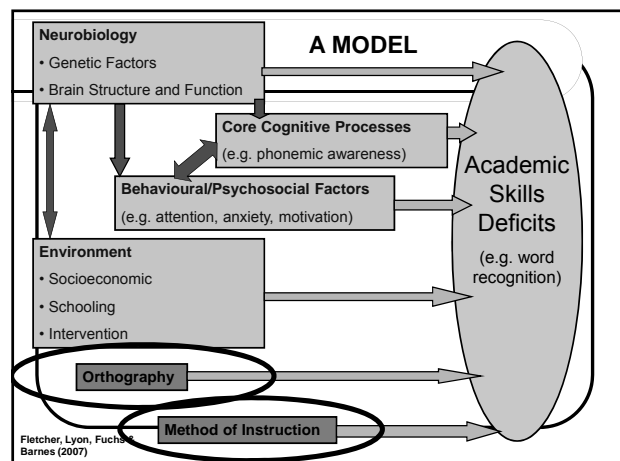
## Assessment of Orthographic Knowledge

- The most effective way to analyse orthographic knowledge is through the analysis of spelling errors in real word spelling, non word spelling and spelling in samples of written expression.
- Review the following sample and discuss whether the errors suggest orthographic processing difficulties ...

## 'Fred's written expression....

WIAT II (Prompt A) .. My favourite game is

.... basket boll because i Like shoting goles. and bownsing the boll and Laaping. my lesete faviret part about basket boll is the rolls Like free shots and bubll dribll. my favret pate is Long sots and Layups. baskit boll is a fun game



## Teaching strategies linked to the three wave model

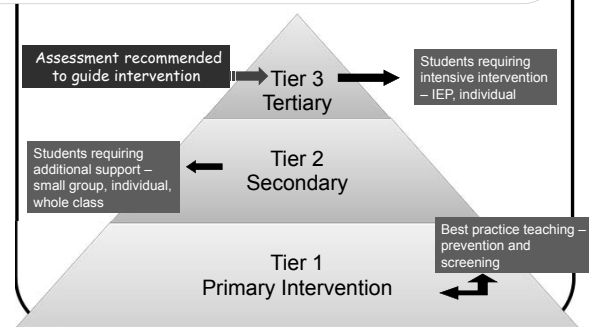


## Three Wave Model

- Wave 1 – The effective inclusion of all students in daily high quality teaching
- Wave 2 – Additional small-group intervention to provide an opportunity to catch up
- Wave 3 – Specific targeted intervention for individual students requiring intensive support.

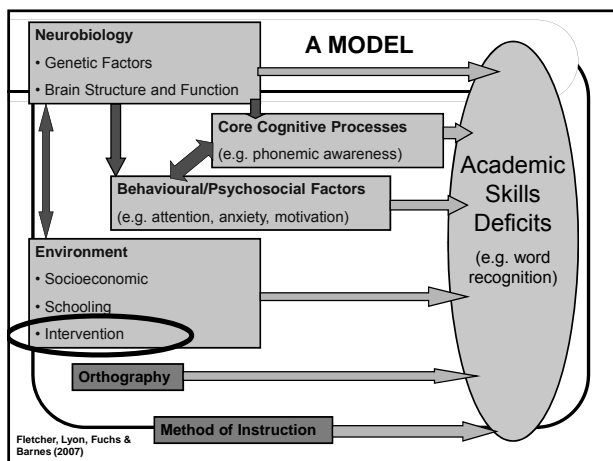


### The three tier or wave model....



### The three tier model

- Review handout - 'Multi-tiered Academic and Behavioural Interventions'.
- Discuss whether this model is evident in the schools you are working in.



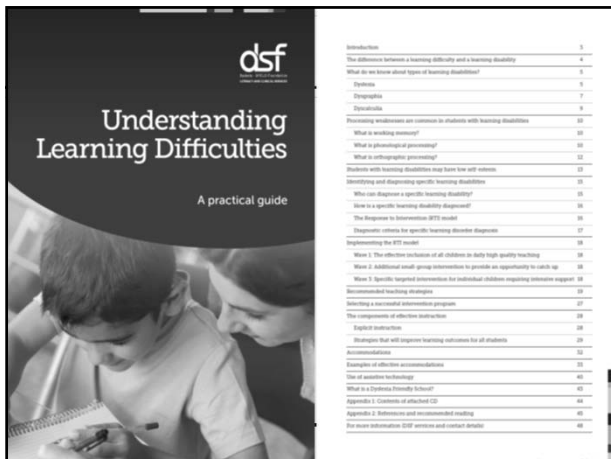
### Current research on effective intervention

The National Research Council (NICHD) has established that interventions are most effective when they:

- Provide **systematic and explicit instruction** on whichever component skills are deficit;
- Provide a significant increase in the intensity of instruction (eg. one on one or small groups of three or four students);

- Provide opportunities for guided practise of new skills;
- Provide appropriate levels of scaffolding to assist students as they develop new skills;
- Provide good curriculum based assessment at frequent intervals (students should develop self-evaluation and checking strategies); and,

- Ensure that teachers have received expert professional development relating to - knowledge of evidence-based literacy and numeracy instruction, formal and informal assessment and screening strategies, and skills in monitoring and reporting progress.



## Systematic and explicit instruction

- State learning objective
- Review / activate prior knowledge
- Teach (explicitly) concept / skill
- Explain lesson importance
- Provide guided practice
- Review / revisit learning objective
- Independent Practice

## Explicit instruction strategies

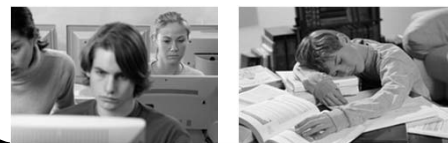
- **Checking for Understanding:** continually verifying that students are learning while they are being taught
- **Explaining:** teaching by telling
- **Modelling:** teaching using think-alouds to reveal to students the strategic thinking required to solve a problem
- **Demonstrating:** teaching using physical objects to clarify the content and to support kinaesthetic learning.

## Strategies that will improve learning outcomes for **all** students

- Maintain high expectations
- Ensure access to curriculum
- Reduce task / information into smaller (meaningful) 'chunks' – ensure student has skills / knowledge to successfully achieve at each step - teach to mastery
- Introduce support / scaffolding to ensure success and reduce anxiety

- Provide regular and targeted feedback – frequently check for understanding
- Revisit / repeat / reinforce key concepts, skills and understandings
- When assessing performance, ensure student is able to demonstrate his/her knowledge, skills and understandings 'on the same basis' as other students – provide accommodations where necessary.

## Assessment of Learning Disorders ... DSM 5



## Diagnostic Features

- “Neurodevelopmental disorder with a biological origin that is the basis for abnormalities at a cognitive level that are associated with the behavioural signs of the disorder”.
- Includes an interaction of genetic and environmental factors that affect the ability to perceive or process verbal or non-verbal information efficiently and accurately.

## Criterion A

- Essential feature of SLD is persistent difficulties learning keystone academic skills, with onset during formal schooling.
- Differs from developmental processes (not related to developmental milestones that occur due to brain maturation).
- Academic skills have to be taught and learned explicitly.

- SLD disrupts the normal pattern of learning academic skills and is not seen as a consequence of lack of opportunity or inadequate instruction.
- Difficulties mastering key academic skills (reading, spelling, writing and mathematics) impede learning in other areas.

- The learning difficulties that result from a SLD can be observed as a range of behaviours or symptoms (see list in Criteria A1-A6).
- These clinical symptoms can be observed, investigated using clinical interview, or ascertained from school reports, rating scales or descriptions in previous professional assessments.

- The learning difficulties are persistent (defined as restricted in learning for at least 6 months despite the provision of extra help at home or school).
- Evidence of persistent difficulties can be derived from cumulative school reports, analysis of the child’s school work, curriculum-based measures or clinical interview.

- For adults, persistence is described as ongoing difficulties in literacy or numeracy skills that were evident in childhood or adolescence, as indicated by school reports, evaluation of previous work or previous assessments.

## Criteria A 1 - 6..

1. Inaccurate or slow and effortful word reading (e.g. difficulties reading aloud, frequently guesses words, as difficulty sounding out words).
2. Difficulty understanding the meaning of what is read (may fail to grasp sequence, relationships, inferences or deeper meaning).
3. Difficulties with spelling (e.g. may add, omit or substitute vowels or consonants).

4. Difficulties with written expression (e.g. makes multiple grammatical or punctuation errors, poor paragraph organisation, written expression lacks clarity).
5. Difficulties mastering number sense, number facts or calculation (e.g. poor understanding of numbers, their magnitude and relationships; counts on fingers to add single digit numbers, gets lost in the middle of computations, may switch procedures).

6. Difficulties with mathematical reasoning (e.g. has severe difficulty applying mathematical concepts, facts, or procedures to solve quantitative problems).

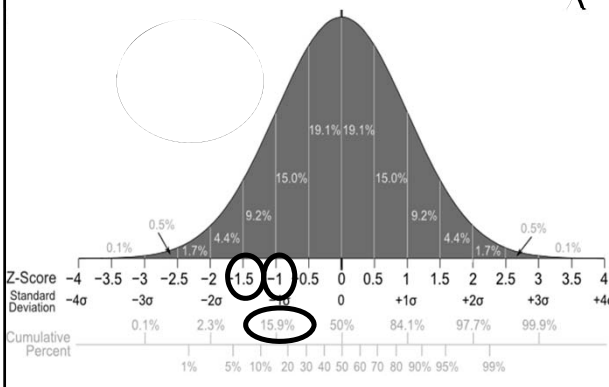
## Criterion B

- A second feature is that performance levels in the academic skill are below average for age.
  - Also includes those students who perform within the average range but this average performance is only sustained through very high levels of effort OR support.

- Criterion B requires psychometric evidence from an individually administered, psychometrically sound and culturally appropriate test of academic achievement that is norm-referenced or criterion referenced.
- Academic skills are seen as falling along a continuum and as such, any threshold used to specify low performance is arbitrary.

- It is suggested that a threshold of 1.5SD below the population mean would provide the greatest diagnostic certainty, precise scores will vary depending on the individual case and the particular test that is used.
  - On the basis of clinical judgement, a more lenient threshold from 1.0 SD may be used, especially when coupled with evidence from clinical assessment, academic history, school reports or other test scores.

## Standard Normal Distribution



## Criterion C

- A third core feature is that the learning difficulties are readily observed in the early school years for most students.
- In others, it may not become apparent until later school years once the learning demands increase and exceed the individual's limited capacities.

## Criterion D

- The learning difficulties are considered specific.
  - Not the result of a intellectual disability or global developmental delay.
  - Not attributed to more general external factors such as economic or environmental disadvantage, chronic absenteeism or lack of educational opportunity.

- Not attributed to a hearing or vision disorder or neurological or motor disorder.
- The learning difficulty may be restricted to one academic skill or domain.

## Assessment

- Comprehensive assessment is required.
- SLD can only be diagnosed after formal education has started but can be diagnosed at any point afterwards (providing that there is evidence of onset during school years).
- No single data source is sufficient for a diagnosis

- Diagnosing SLD involves the consideration of:
  - The individual's medical, developmental, educational and family history.
  - Evaluation of the learning difficulty including current observable difficulties and previous delays.
  - The level of functional impact on academics, occupation or social engagement.

- Previous or current school reports or portfolios of work requiring the application of the academic skill.
- Curriculum based assessment
- Previous or current scores from individual standardised tests of academic achievement.

- If an intellectual, sensory, neurological or motor disorder is suspected, clinical assessment of these areas should also be included.
- Comprehensive assessment will involve professionals with expertise in specific learning disorder and psychological /cognitive assessment.

### Associated Features supporting Diagnosis

- Frequently preceded in early years by delays in attention, language or motor skills that may persist and co-occur with SLD.
- An uneven profile of abilities is common.
- Changes in symptoms or functional impact occur with age so that an individual may have a persistent or shifting array of difficulties across the lifespan.

### Culture-Related Diagnostic Issues

- SLD occurs across languages, cultures, races and socioeconomic conditions but may vary in response to the nature of the spoken/written symbol systems and cultural/educational practices.
- In English-Language learners (ESL), assessment should include consideration of whether the source of reading difficulties is limited proficiency with English of a SLD.

- Risk Factors for SLD in ESL students include:
  - Family history of SLD or language delay in the home language
  - Learning difficulties in English and a failure to catch up with peers.

- If there is a suspicion of cultural or language differences, assessments needs to take into account the individual's language proficiency in their first language as well as in their second language.
- Assessment should also consider the linguistic and cultural context the individual is living as well as their learning history in the original language.

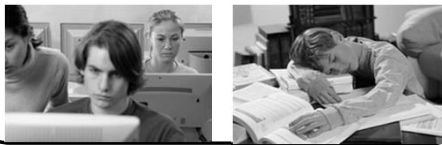
## Comorbidity

- SLD commonly co-occur with neurodevelopmental or other mental disorders.
- Clinical judgement is required to attribute such impairment to learning difficulties.
- If there is an indicator that another diagnosis **could** account for the difficulties in learning the academic skill, SLD should not be diagnosed.

## DSM 5 – Assessment tools

Review the A3 handout labelled 'Cross Battery Analysis'. Which of the assessment tools are you currently using? Discuss in small groups.

## Diagnostic Statements ...



## DSM 5 – SLD Impairment of different academic domains

1. SLD with impairment in reading  
**Word reading accuracy\*, Reading rate or fluency\*, Reading comprehension**
2. SLD with impairment in written expression  
Spelling accuracy, Grammar and punctuation accuracy, Clarity or organisation of written expression
3. SLD with impairment in mathematics  
Number sense\*, Memorisation of arithmetic facts\*, Accurate or fluent calculation\*, Accurate math reasoning.

*\*Dyslexia / \*Dyscalculia...*

## Levels of Severity..

The four diagnostic criteria (A, B, C & D) are to be met based on a clinical synthesis of the individual's history (developmental, medical, family, educational), school reports and **psycho-educational assessment**.

The level of severity should be specified as:

- Mild
- Moderate, or
- Severe

## Levels of Severity

- Consistent with definitional scheme of DSM-5
- Refers to levels of support needed to function (functional impact of the SLD)
  - Requiring support
  - Requiring moderate support
  - Requiring very substantial support
- Likely to relate to proposed disability loadings

## Levels of Support

- Acknowledge diversity of LD
- Can provide direction in how to respond
- However, levels are based on subjective clinical judgement

“Potentially, the labels will come to be treated in the same way that mild, moderate, severe, and profound levels of “mental retardation” have been, linked to services / funding.”

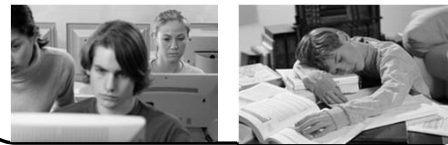
## A Case Study



## Minnie Mouse

- Review part one of report provided and consider the results against the criteria listed on the Workshop Activity (DSM 5 Checklist).
- Discuss.

## A comment on reports ...



## Consumer-Focused Psychological Assessment

- Brenner, E. (2003). Consumer-Focused Psychological Assessment. *Professional Psychology: Research and Practice*, 34, 240-247.

## Feedback from consumers ...

### Relevance

- Consumers indicate that reports:
  1. Contain too much jargon; reading level is frequently too advanced
  2. Over-rely on standard battery of tests
  3. Contain stereotyped content
  4. Are deficit-focused
  5. Contain vague recommendations



## In order to improve reports ...

### Response:

- Create a useful product:
  1. Reduce jargon; write at a lower reading level
  2. Reduce use of standard battery; focus on referral questions
  3. Individualise content
  4. Focus on strengths
  5. Write concrete recommendations

## A few final comments / possible concerns ...



## DSM-5 Definitions

The definitions in the DSM-5 are for “clinical, research, and educational purposes”.

## Relevant Contexts

- Narrow focus on academic performance
- Inadequate for defining the entity of LD
- Effect of difficulties on everyday functioning
- Important to understand how LD relates to cognition and other aspects of functioning

## Relevant Contexts

“Acknowledging other manifestations but discounting them in the identification process falsely limits what a LD can be in practice.”

## Emphasis on Basic Skills

- The manifestation symptoms (Criteria A) name six primarily basic (or “foundational”) skills
  - E.g. learning to read: inaccurate or slow and effortful word reading; constant need to reread written material to understand its meaning; multiple errors in spelling, punctuation, grammar; inaccurate or slow counting; persistent difficulties in retrieving number facts; multiple errors in arithmetic calculation.

## Emphasis on Basic Skills

- Ability to perform foundational skills is necessary for higher level performance
- However, LD can affect higher-level skills performance even when basic skills are mastered

## Secondary and Adult Populations

- More likely to exhibit high-level skills difficulties
- LD can occur across the lifespan
- In RTI context, early intervention may prevent LD identification

## Neurodevelopmental Versus Neurocognitive

- Neurocognitive disorders include cognitive decline (i.e., an acquired condition)
- Neurodevelopmental disorders must have origin in the developmental period
- Burden of tracing the origin of difficulties

## Ethnic and Cultural Considerations

- Definitions and operational criteria may favour assessment tools (e.g., IQ tests) and practices (e.g., subjective judgement, targeting local norm low achievers)
- Definitions may give insufficient guidance on how to avoid bias (e.g., how second language status may confound identification)

## Challenge of remaining current

- Understandings of LD are evolving
- Momentum to move beyond the discrepancy approach
- RTI model is changing how LD is identified and how services are delivered
- LD is “an unexpected failure to learn”
- Exclusion has been a constant – we know what it is not

Thank you!



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